

Unit Title: Bridges of Understanding

Teacher & Grade: Gifted, Grade 5

Big Idea/Enduring Understanding: What do you want students to remember in 10 years?

Bridges foster understanding of our world.

Essential Question(s):

How do bridges help us to understand our world?

Guiding Questions:

Product/Performance Task- Students will create to demonstrate their understanding (flexible application of knowledge and skills):

Students will be presented with a problem/scenario. They will collaboratively design and create a solution and present findings that explain the economic, cultural, and environmental impact.

Real world purpose/audience:

peers; older students, community members, experts.....at a symposium--Tremont Library

Real world models (e.g. mentor texts, etc.):

the real world

List of possible texts students will read to help them uncover topic:

historical fiction

film

(work with specialists)

Standards:

Math: Grade 5

Measurement Standard

Students estimate and measure to a required degree of accuracy and precision by selecting and using appropriate units, tools and technologies.

Measurement Units

1. Identify and select appropriate units to measure angles; i.e., degrees.

4. Demonstrate understanding of the differences among linear units, square units and cubic units.

5. Determine the appropriate unit of U.S. standard or metric measurement to measure length, weight (mass), capacity (volume) of three dimensional objects.
6. Compare U. S. standard and metric measurements of length, weight, and capacity.

Use Measurement Techniques and Tools

7. Make conversions within the same measurement system while performing computations.
13. Understand how to construct accurate, simple geometric shapes using tools, e.g., circles, rectangles, squares, triangles.

Geometry and Spatial Sense Standard

Students identify, classify, compare and analyze characteristics, properties and relationships of one-, two- and three-dimensional geometric figures and objects. Students use spatial reasoning, properties of geometric objects, and transformations to analyze mathematical situations and solve problems.

Characteristics and Properties

2. Use standard language to describe line, segment, ray, angle, skew, parallel and perpendicular.
3. Label vertex, rays, interior and exterior for an angle.
4. Describe and use properties of congruent figures to solve problems.
5. Use physical models to determine the sum of the interior angles of triangles and quadrilaterals.

Data Analysis and Probability Standard

Students pose questions and collect, organize, represent, interpret and analyze data to answer those questions. Students develop and evaluate inferences, predictions and arguments that are based on data.

Data Collection

4. Determine appropriate data to be collected to answer questions posed by students or teacher, collect and display data, and clearly communicate findings.

LA: Grade 5

Standard: 02 Acquisition of Vocabulary

Use context clues to determine the meaning of new vocabulary.

Standard: 03: Reading Process: Concepts of Print, Comprehension Strategies

Make meaning through asking and responding to a variety of questions related to text.

- Answer literal, inferential, and evaluative questions to demonstrate comprehension of grade-appropriate print texts, electronic, and visual media.
- Demonstrate a personal response to texts (e.g., reflections, journals, discussions).

Standard: 04 Reading Applications: Informational, Technical and Persuasive Text

Use text features and graphics to organize, analyze and draw inferences from content and to gain additional information.

- Use text features, such as chapter titles, headings, and subheadings; parts of books, including the index, table of contents, and online tools (search engines) to locate

information.

- Analyze information found in maps, charts, tables, graphs, and diagrams.

Explain how main ideas connect to each other in a variety of sources.

- Compare important details about a topic, using different sources of information, including books, magazines, newspapers, and online resources.

Standard: 06 Writing Processes

Generate writing topics and establish a purpose appropriate for the audience.

- Generate writing ideas through discussions with others, background reading, interviews, surveys, or lists of writing ideas.
- Conduct background reading, interviews, or surveys when appropriate.
- State and develop a clear main idea for writing.

Determine audience and purpose for self-selected and assigned writing tasks.

- Determine a purpose and audience.

Clarify ideas for writing assignments by using graphics or other organizers.

- Use organizational strategies (e.g., outlines, diagrams, story maps, jotlists, webs, and Venn diagrams) to plan writing.

Use revision strategies to improve the overall organization, the clarity and consistency of ideas within and among paragraphs and the logic and effectiveness of word choices.

- Organize writing, beginning with an introduction, body, and a resolution of plot, followed by a closing statement or a summary of important ideas and details.
- Vary simple, compound, and complex sentence structures.
- Group related ideas into paragraphs, including topic sentences, following paragraph form, and maintain a consistent focus across paragraphs.
- Vary language and style as appropriate to audience and purpose.
- Use available technology to compose text.
- Reread and assess writing for clarity, using a variety of methods (e.g., writer's circle or author's chair).
- Add and delete information and details to better elaborate on a stated central idea and to more effectively accomplish purpose.
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- Rearrange words, sentences, and paragraphs, and add transitional words and phrases to clarify meaning.

Select more effective vocabulary when editing by using a variety of resources and clarity and consistency of ideas within and among paragraphs and the logic and effectiveness of word choices.

- Use resources and reference materials (e.g., dictionaries and thesauri) to select more effective vocabulary.

Apply tools to judge the quality of writing.

- Apply tools (e.g., rubric, checklist, and feedback) to judge the quality of writing.

Produce informational essays or reports that convey a clear and accurate perspective and support the main ideas with facts, details, examples and explanations.

- Write informational essays or reports, including research, that organize information with a clear introduction, body, and conclusion following common expository structures when appropriate (e.g., cause-effect, comparison-contrast) and include facts, details, and

examples to illustrate important ideas.

Research

Formulate open-ended research questions suitable for inquiry and investigation and develop a plan for gathering information.

- Generate a topic, assigned or personal interest, and open-ended questions for research and develop a plan for gathering information.

Locate and summarize important information from multiple sources.

- Locate sources and gather relevant information from multiple sources (e.g., school library catalogs, online databases, electronic resources, and Internet-based resources).

Organize information in a systemic way.

- Identify important information found in sources and paraphrase the findings in a systematic way (e.g., notes, outlines, charts, tables, or graphic organizers).
- Compare and contrast important findings and select sources to support central ideas, concepts, and themes.

Communicate findings orally, visually and in writing or through multimedia.

- Use a variety of communication techniques, including oral, visual, written, or multimedia reports to present information gathered.

Communications: Oral and Visual

Use effective listening strategies, summarize major ideas and draw logical inferences from presentations and visual media.

- Demonstrate active listening strategies (e.g., asking focused questions, responding to cues, making visual contact).
- Interpret the main idea and draw conclusions from oral presentations and visual media.

Explain a speaker's point of view and use of persuasive techniques in presentations and visual media.

- Identify the speaker's purpose in presentations and visual media (e.g., to inform, entertain, persuade).
- Discuss how facts and opinions are used to shape the opinions of listeners and viewers.

Vary language choice and use effective presentation techniques, including voice modulation and enunciation.

- Demonstrate an understanding of the rules of the English language and select language appropriate to purpose and audience.

Select an organizational structure appropriate to the topic, audience, setting and purpose.

Deliver informational presentations (e.g., expository, research) that:

- a. demonstrate an understanding of the topic and present events or ideas in a logical sequence;
- b. support the main idea with relevant facts, details, examples, quotations, statistics, stories, and/or anecdotes;
- c. organize information, including a clear introduction, body, and conclusion and follow common organizational structures when appropriate (cause-effect, compare-contrast)
- d. use appropriate visual materials (e.g., diagrams, charts, illustrations) and/or technology; and
- e. draw from several sources and identify sources used.

Present ideas in a logical sequence and use effective introductions and conclusions that guide and inform a listener's understanding of key ideas.

Deliver organized presentations (e.g., expository, research) that:

- a. demonstrate an understanding of the topic and present events or ideas in a logical sequence;
- b. support the main idea with relevant facts, details, examples, quotations, statistics, stories, and/or anecdotes;
- c. use appropriate visual materials (e.g., diagrams, charts, illustrations) and/or technology; and
- d. draw from sources.

Give presentations using a variety of delivery methods, visual materials and technology.

Deliver formal and informal descriptive presentations recalling an event or personal experience that convey relevant information and descriptive details.

Deliver persuasive presentations that:

- a. establish a clear position;
- b. include relevant evidence to support a position and to address potential concerns of listeners; and
- c. follow common organizational structures when appropriate (e.g., cause-effect, compare-contrast, problem-solution).

Gifted:

Science:

Ability To Do Technological Design

- Describe and illustrate the design process
 - Revise an existing design used to solve a problem based on peer review.

Understanding Technology

- Describe how technology affects human life
 - Investigate positive and negative impacts of human activity and technology on the environment.

Doing Scientific Inquiry

- Organize and evaluate observations, measurements and other data to formulate inferences and conclusions.
 - Use evidence and observations to explain and communicate the results of investigations

Library/Research:

Social Studies:

Economics

- Explain how competition affects producers and consumers in a market economy and why specialization facilitates trade.
 - Explain the general relationship among supply, demand, and price in a

competitive market.

- Explain why competition among consumers/buyers results in higher product prices.
- Explain why competition among producers/sellers results in lower costs and prices, higher product quality, and better customer service.

Geography

- Identify and explain ways people have affected the physical environment of North American and analyze the positive and negative consequences.
 - Analyze the positive and negative consequences of human changes to the physical environment, including:
 - b. Highway systems
 - Identify the physical and human characteristics of different physical environments affect human activities in North America.
- Identify the physical and human characteristics of places and regions in North American.
 - Describe and compare the landforms, climates, population, culture, and economic characteristics of places and regions in North America.
- Use map elements or coordinates to locate physical and human features of North America.
 - Use coordinates of latitude and longitude to determine the absolute location of points in North America.

Social Studies Skills and Methods

- Obtain information from a variety of primary and secondary sources using the component parts of the source.
- Use a variety of sources to organize information and draw inferences.
- Use problem-solving skills to make decisions individually and in groups.

Technology

Standard: Nature of Technology

A 03-05 Compare and discuss the characteristics of technology in our community

- 01 A 01 Create a human-made product from natural materials (e.g., process natural materials into new products such as a stick picture frame).

C 03-05 Explain and demonstrate the influence of technology throughout history.

- 02 Explain how technology and invention have changed economic and social development

E 03-05 Identify development patterns and examine the influence of technology on the world.

- 02 Investigate and assess the influence of a specific technology (e.g., Styrofoam cafeteria plates, car exhaust systems, etc.) on the environment
- 03 Examine the trade-offs of using a product or system and decide when it could be used (e.g. determine the amount of supplies/luggage and mode of transportation needed for traveling various lengths of days and distances).

Standard: Technology for Productivity Applications

A 03-05 Understand computer and multimedia technology concepts and communicate using the correct terminology.

- 01 Define and use new technology terminology based on the computer and multimedia technology resources being used.

B 03-05 Use appropriate tools and technology resources to complete tasks and solve problems.

- 03 Collect information for projects using still and video digital cameras, scanners and electronic resources.
- 04 Create a presentation using multimedia software that incorporates graphics, video and sound to present the findings of a group research project.

C 03-05 Use productivity tools to produce creative works and prepare publications.

- 03 Use technology resources (e.g., video projection, networks, listservs, distance learning and interactive boards) for presenting information.

B 03-05 Develop, publish, and present information in print and digital formats.

- 01 Produce a slide show from storyboard, using text, graphics and sound with appropriate transitions and effects.
- 02 Collaborate in a class video project (e.g., act as camera person, actor or director in a video project as a part of a unit of study).
- 03 Use a simple authoring tool to create class Web page.
- 04 Evaluate and modify a presentation or document for different audiences (e.g., one person or a group of people).
- 05 Use advanced software features to publish information in printed form (e.g., card, calendar, banner, one-page report, flyer, newsletter).

C 03-05 Use technology communications to participate in online group collaborative interactive projects and activities.

- 02 Communicate in a monitored, online discussion (e.g., discuss books being read, share local history).
- 03 Gather and share information in online learning activities (e.g., examine historical journals and share observations).

A 03-05 Describe types of information: facts, opinions, primary/secondary sources; and formats of information: number, text, sound, visual, multimedia; and use information for a purpose.

- Choose a variety of formats for presenting information (e.g., pictures, texts, slides.)
- 01 Identify questions related to an assigned topic or personal information need.

B 03-05 Use technology to find information by applying a research process to decide what information is needed, find sources, use information and check work.

- 03 Select and access information resources: online library catalog, web sties, and electronic formats (e.g. CD-ROM, DVD, audio files)

- 04 Record and use selected information to create a product for the assigned topic or
- personal information need.
- 05 Cite sources used: author, title of resource, publisher or source of information, and copyright date.
- 06 Describe how information about a topic was gathered (e.g., discuss the information process).

C 03-05 Use the Internet to find, use, and evaluate information.

- 04 Identify information on the website: URL extensions, author, title, date produced, special features (images, puzzles, activities), products, services, resources, etc.

A 03-05 Describe and apply a design process to solve a problem.

- 01 Arrive at a solution to a technological problem and fabricate a prototype model for the solution.
- 02 Use data to test and evaluate the prototype solution.
- 03 Make sketches with a list of parts required for a solution to a technological problem.
- 04 Analyze the requirements for a design including such factors as the desired elements and features of a product or system and the limits that are placed on the design (e.g., if the class were to prepare and deliver food to the homeless or a nursing home, what are the desired features and what limits are there to what can be done?).
- 05 Improve the designed prototype solution where tests indicate need.

B 03-05 Describe how engineers and designers define a problem, creatively solve it, and evaluate the solution.

- 02 Evaluate a model used to communicate and test design ideas and processes (e.g., toy prototype, car models, building models)
- 03 Build models which can be used to communicate and test design ideas and processes (e.g. tornado shelters)

A 03-05 Develop an understanding of how physical technologies enhance our lives.

- 03 Describe how the value of goods and services vary by their location.

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A COMPLEX THINKER . . .

Indicator 1: Identifies and defines authentic problems and essential questions.

We hear it when people ask:

- "What's really the problem at the heart of all this?"
- "What's the main idea that ties all this together?"
- "How do these things relate to each other?"

We see it when people:

- Clarify and sort essential information from non-essential information.
- Try to understand the root of the problem.
- Find the "umbrella" concept that unites all the pieces.
- Create a research question to begin exploring a problem.

In Other Words... Teachers help students see what really matters and show them how to independently explore and solve problems.

Indicator 2: Collects, assesses and analyzes relevant information.

We hear it when people ask:

- "What's the best way to research this?"
- "How do I know this is true? How can I find out?"
- "So what? How is this information significant?"
- "Does this evidence help me answer the question or not?"
- "How are these things similar? Different?"

We see it when people:

- Break down a concept, idea, or evidence into its component parts, to understand how the parts make the whole.
- Sift through pieces to learn more about a problem.
- Keep a record of what they find and where to find it again.
- Figure out what evidence is most relevant.
- Evaluate sources of information for their credibility.
- Use graphic organizers to process information as it comes to them.

In Other Words... Teachers help students learn how to do research and examine evidence.

Indicator 3: Explores and develops solutions.

We hear it when people ask:

- "How can we solve this? How ELSE can we solve this?"
- "Is this solution really the best one? What are the drawbacks and benefits?"
- "What are possible unintended consequences if this happens?"

- "Are we using our resources in the best way?"
- "How can we make this better?"

We see it when people:

- Use evidence to support a position.
- Think outside the box.
- Propose answers to their research or essential question, using data.
- Discuss the best way to use limited resources to solve the problem.

In Other Words... Teachers help students learn to develop multiple approaches to solve complex problems.

Indicator 4: Makes judgments and decisions.

We hear it when people ask:

- "How do we know that's true?"
- "What makes this better than that?"
- "By what criteria is that 'good' work?"
- "What is the rationale behind that person's position?"
- "How credible, reliable, or accurate is that position?"

We see it when people:

- Analyze and evaluate data/evidence, arguments, claims and beliefs.
- Synthesize and make connections between information and arguments.
- Interpret information and draw conclusions based on the best analysis.
- Weigh solutions and positions based on criteria.

In Other Words... Teachers help students learn to evaluate positions and look for the reasoning behind actions and beliefs.

Indicator 5: Uses systems thinking to understand complex inter-relationships.

We hear it when people ask:

- "What is changing? How is it changing?"
- "What is the relationship between the things that are changing? Is there a cause-and effect relationship at work?"
- "What part do we play in this system?"
- "What are the potential consequences of our actions?"
- "What happens when something gets added or taken away from the system?"

We see it when people:

- Develop awareness by seeking to understand the big picture
- Develop understanding by changing perspectives
- Plan and take action by considering both short and long term consequences of actions, finding unintended and delayed consequences, and checking results and changing actions if needed.
- Examine parts to see the whole interconnected system.

In Other Words... Teachers and students strive to understand the complexities and interconnectedness of our world systems by using the habits, strategies, and tools of systems thinking.

Indicator 6: Reflects critically on learning experiences, processes and solutions.

We hear it when people ask:

- “What were my strengths?”
- “How can I learn from other people to grow in new directions?”
- “What knowledge do I need? Skills? Understandings?”
- “What have I taken away from this experience?”
- “What will I do differently next time?”

We see it when people:

- Pause to examine their own work.
- Seek both “warm” and “cool” feedback to improve themselves.
- Look back on the learning process steps to see where they performed well or missed the target.
- Use data to inform their practice.
- Make specific, measurable, attainable, results-oriented and time-bound goals and create benchmarks.
- Celebrate their own successes.

In Other Words... Teachers help students to think about their thinking, to make their thinking better next time.